

REMARKS

Applicants thank the Examiner for acknowledging Applicants' claim to foreign priority under 35 U.S.C. § 119, and receipt of the priority document filed September 29, 2006; acceptance of the drawings filed on September 29, 2006; and for initialing and returning the PTO SB/08 Forms submitted with the Information Disclosure Statements of September 29, 2006.

Claim Objections

Claim 6 is objected to because of an alleged informality. Applicants have amended the claims in a manner consistent with the Examiner's recommendations. Furthermore, Applicants have amended the claim in a manner believed to overcome the alleged informalities and in a manner that is not believed to affect the scope of the claim in any way, and thus it is believed no estoppel is implicated by the amendment to overcome the alleged informalities.

Claim Rejections - 35 USC § 102

Claims 1-9, 20-26, 28, and 32-33 are rejected under 35 U.S.C. 102(b) as being anticipated by Libori et al. (US 2002/0061176; hereafter "Libori"). Applicants traverse all of these rejections.

Claim 1

A feature of independent claim 1 recites, in part, "a given first threshold and a given second threshold strictly higher than the first threshold". The Examiner maintains that this feature is disclosed by Libori. This feature however, is missing from Libori.

The Examiner asserts that FIG. 39 of Libori allegedly discloses all of the features of the independent claim 1. Libori, however, shows a fibre design with three rings (page 20, paragraph [0217]) but does not disclose or suggest the given first or second threshold of the claimed invention.

Another feature of independent claim 1 recites, in part, “the average distance between the outer perimeter (Ca) of the second annular region (rb) and the inner perimeter (Cb) of the third annular region (rc) is less than half the average dimension of a large cavity (4)”. The Examiner asserts that FIG. 39 of Libori discloses this claimed feature of independent claim 1. Libori, however, discloses, “an inner ring of cladding features (391) has smaller diameter than the outer cladding features (392) that again have smaller diameter than the outermost cladding features (393)”. Thus, Libori does not disclose or suggest “the average distance...is less than half the average dimension of a large cavity (4)”. Claims 2-29 should also be patentable at least by virtue of their respective dependencies from claim 1.

Claim 2

A feature of claim 2 recites, in part, “the average distance...is less than one quarter the average dimension of a large cavity (4)”. The Examiner maintains that Libori allegedly discloses this feature. Libori, however, discloses rings (391), (392), and (393), but does not disclose or suggest “the average distance...is less than half the average dimension of a large cavity (4)”.

Claim 3

A feature of claim 3 recites, in part, “small cavities (2) the cross section whereof remains strictly below the first threshold”. The Examiner cites element (391) of Libori as disclosing this feature of claim 3. Element (391) of Libori, however, discloses an inner ring of cladding features; but does not disclose or suggest “small cavities (2) the cross section whereof remains strictly below the first threshold”.

Claim 4

Claim 4 recites, in part, “any radius that goes from the center of the core toward the exterior of the optical fiber sweeps out an angular sector between two medium-size cavities (3)

in the second annular region (rb) it encounters at least one cavity (2, 3) either in the second annular region (rb) or in the first annular region (ra) over at least a portion of the angular sector that it sweeps out”.

The Examiner asserts that element 392 of Libori discloses these features of claim 4. Libori, however, shows in FIG. 39 that a radius that goes from the center of the core toward the exterior of the optical fiber sweeps out an angular sector between two medium-size cavities in the second annular region but does not encounter at least one cavity in the second or first annular region.

Claim 5

Claim 5 recites, in part, “the average distance...is less than half the average dimension of a medium-size cavity (3)”. The Examiner maintains that Libori allegedly discloses this feature. Libori, however, discloses rings (391), (392), and (393), but does not disclose or suggest “the average distance...is less than half the average dimension of a medium-size cavity (3)”.

Claim 6

Claim 6 recites, in part, “at least ten of the large cavities in the third annular region are in the same annular layer and each has a ratio between its greatest dimension and the distance from its center to the core center that is greater than 0.3”. The Examiner maintains that element 393 of Libori allegedly discloses these features. Element 393 of Libori, however, discloses an outermost cladding feature. Furthermore, these features are missing from Libori.

Claim 8

The Examiner asserts that, “the fiber can be used at an arbitrary wavelength which satisfies the recited condition.” Libori, however, defines in claims 11-17, the wavelength range of the optical fiber varying from 0.3 μm to 2.0 μm . Furthermore, Libori does not disclose that

“the space (e) between two contiguous large cavities (4) in the third annular region (rc) is less than the wavelength at which the optical fiber is used”.

Claim 9

The Examiner interprets the term “circular” in claim 9 as “encompassing more than six sides” and asserts that the Examiner’s definition of “circular” is “consistent with applicant’s use of the term in the application.” Applicants respectfully disagree with Examiner’s interpretation. Libori shows hexagonal arrangements but does not disclose “the second annular region (rb) and the third annular region (rc) are circular.” Furthermore, Libori does not show more than six sides and by applying the Examiner’s definition of “circular”, the hexagonal arrangements in Libori would not meet the Examiner’s definition of “circular” because it does not have “more than six sides.”

Claim 20

The Examiner asserts that paragraph [0219] of Libori corresponds to claim 20, in that, “the fiber may be made with an elliptic core, in which case it would have just two axial symmetries.” The Examiner also cites paragraphs [0116] and [0115] of Libori as corresponding to claim 20. However, paragraphs [0115], [0116], and [0219] describe the shape of the core and the Examiner draws the conclusion of the core having two axial symmetries. Regardless of the core symmetry, however, Libori does not disclose the axial symmetries of “the distribution of the *cavities* in the first annular region.”

Claim 28

Libori does not disclose or suggest an “optical regenerator device for optical signals”.

Claim Rejections - 35 USC § 102

Claims 1-13, 15-18, 30, and 32-33 are rejected under 35 U.S.C. 102(b) as being anticipated by Saitoh et al. (hereafter "Saitoh"). Applicants traverse all of these rejections.

Claim 1

A feature of independent claim 1 recites, in part, "a given first threshold and a given second threshold strictly higher than the first threshold". The Examiner maintains that this feature is disclosed by Saitoh. This feature however, is missing from Saitoh

The Examiner asserts that d3 of Saitoh discloses "medium-size cavities cross sections of which remain strictly between a given first threshold and a given second threshold strictly higher than the first threshold" and d4 of Saitoh discloses "large cavities the cross sections of which remain strictly above the second threshold". Saitoh, however, does not disclose that d3 and d4 "remain strictly between a given *first threshold* and a given *second threshold* strictly higher than *the first threshold*" and "large cavities the cross sections of which remain strictly above the *second threshold*".

The Examiner also asserts that FIG. 5(a) of Saitoh corresponds to "the average distance between the outer perimeter of the second annular region and the inner perimeter of the third annular region is less than half the average dimension of a large cavity". Saitoh, however, states that the PCFs have small hole-to-hole spacing of 1.56 μm . FIG. 5(a) discloses that $d3/(\text{hole-to-hole spacing}) = 0.67$. As a result, $d3 = 1.0452 \mu\text{m}$. Thus, the hole-to-hole spacing of Saitoh (1.56 μm) is not less than half the average dimension of a large cavity ($1.0452\mu\text{m}/2 = 0.5226$) and does not disclose, "the average distance between the outer perimeter of the second annular region and the inner perimeter of the third annular region is less than half the average dimension

of a large cavity.” Claims 2-29 should also be patentable at least by virtue of their respective dependencies from claim 1.

Claim 2

A feature of claim 2 recites, in part, “the average distance...is less than one quarter the average dimension of a large cavity (4)”. The Examiner maintains that Saitoh allegedly discloses this feature. Saitoh, however, states that the PCFs have small hole-to-hole spacing of 1.56 μm . $d_3 = 1.0452 \mu\text{m}$. One quarter of $d_3 = 0.2613$. Thus, Saitoh does not disclose, “the average distance...is less than one quarter the average dimension of a large cavity (4)”.

Claim 3

A feature of claim 3 recites, in part, “small cavities (2) the cross section whereof remains strictly below the first threshold”. The Examiner cites element d of Saitoh as disclosing the recited feature of claim 3. Element d of Saitoh, however, discloses an air-hole; but does not disclose or suggest “small cavities (2) the cross section whereof remains strictly below *the first threshold*”.

Claim 4

Claim 4 recites, in part, “any radius that goes from the center of the core toward the exterior of the optical fiber sweeps out an angular sector between two medium-size cavities (3) in the second annular region (rb) it encounters at least one cavity (2, 3) either in the second annular region (rb) or in the first annular region (ra) over at least a portion of the angular sector that it sweeps out”.

The Examiner asserts that Saitoh discloses these features of claim 4. Saitoh, however, shows in FIG. 5(a) that a radius that goes from the center of the core toward the exterior of the

optical fiber sweeps out an angular sector between two medium-size cavities in the second annular region does not encounter at least one cavity in the second or first annular region.

Claim 6

The Examiner asserts that Saitoh discloses claim 6. Saitoh, however, states that the PCFs have small hole-to-hole spacing of 1.56 μm . $d_3 = 1.0452 \mu\text{m}$. $d_1/(\text{hole-to-hole spacing}) = 0.32$. $d_1 = 0.4992 \mu\text{m}$. $d_2/(\text{hole-to-hole spacing}) = 0.45$. $d_2 = 0.702 \mu\text{m}$.

Therefore the “distance from its center to the core center” of Saitoh = hole-to-hole spacing * 6 = 9.36 μm . Thus, the “ratio between its greatest dimension and the distance from its center to the core center” = $1.0452/9.36 = 0.11$. Saitoh, therefore, does not disclose, “a ratio between its greatest dimension and the distance from its center to the core center that is greater than 0.3”.

Claim 7

The Examiner asserts that Saitoh discloses claim 7. Saitoh, however, in FIG. 5(a) and 5(b) shows that the PCFs in the corner of the hexagon arrangement are not “angularly offset relative to the large cavities”. Therefore, Saitoh does not disclose that, “at least ten of the medium-size cavities in the second annular region are in the same annular layer and angularly offset relative to the large cavities in such a manner as to face the spaces between the large cavities.”

Claim 9

The Examiner interprets the term “circular” in claim 9 as “encompassing more than six sides” and asserts that the Examiner’s definition of “circular” is “consistent with applicant’s use of the term in the application.” Applicants respectfully disagree with Examiner’s interpretation. Saitoh shows hexagonal arrangements but does not disclose “the second annular region (rb) and

the third annular region (rc) are circular.” Furthermore, Saitoh does not show more than six sides and by applying the Examiner’s definition of “circular”, the hexagonal arrangements in Libori would not meet the Examiner’s definition of “circular” because it does not have “more than six sides.”

Claim Rejections - 35 USC § 103

Claims 27 and 29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Libori. Applicants traverse all of these rejections.

Claims 27 and 29

The Examiner admits that Libori does not specifically disclose the recited generic optical devices. However, the Examiner asserts that, “a person of ordinary skill in the art would have found it obvious to use the Libori fibers in any device which could benefit from the disclosed properties.” Applicants respectfully disagree. Firstly, Libori fails to teach or suggest all of that which is claimed, as discussed above. Secondly, it is not common knowledge for “wavelength converter device comprising an optical fiber,” and “optical filter device including a saturable absorber and comprising an optical fiber”.

Conclusion

In view of the above, reconsideration and allowance of this application are now believed to be in order, and such actions are hereby solicited. If any points remain in issue which the Examiner feels may be best resolved through a personal or telephone interview, the Examiner is kindly requested to contact the undersigned at the telephone number listed below.

The USPTO is directed and authorized to charge all required fees, except for the Issue Fee and the Publication Fee, to Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account.

Respectfully submitted,


CHRISTOPHER LIPP

Reg. No. 41157
Theodore C. Shih
Registration No. 60,645

SUGHRUE MION, PLLC
Telephone: (202) 293-7060
Facsimile: (202) 293-7860

WASHINGTON OFFICE

23373

CUSTOMER NUMBER

Date: May 20, 2008